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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,240	07/29/2003	Kouji Yamaguchi	740709-507	4752

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EXAMINER

MCKINNON, TERRELL L

ART UNIT PAPER NUMBER

3743

DATE MAILED: 02/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/628,240	Applicant(s) YAMAGUCHI ET AL.	
	Examiner Terrell L Mckinnon	Art Unit 3743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1- and 5-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1 and 5-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/23/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

Receipt is acknowledged of applicant's amendment filed November 29, 2004. Claims 2-4 have been canceled without prejudice. Claims 1 and 5-20 are pending and an action on the merits is as follows.

Applicant's arguments with respect to claims 1 and 5-20 have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 12-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 12-17, as written, is classified as a product by process claim. A single claim, which claims both an apparatus and the method steps of using the apparatus, is indefinite under USC 112, second paragraph. This type of claim is indefinite because it fails to positively recite the boundaries of protection. The metes and bounds of the claim cannot be determined because it is unclear whether protection is sought for the method or for the apparatus.

As best understood of the examiner, claims 12-17 will be treated on the merits in this office action.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 5, 6, 8-12, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramshaw et al. (U.S. 6,059,024) in view of Takabayashi et al. (U.S. 5,262,227).

Ramshaw's invention discloses a polymer film heat exchanger comprising:

- a flexible heat exchanger including a pair of thermoplastic polymer films;
- a heat conductive film on the surface, the heat exchanger is capable of being used in a variety of environments including spacecraft vehicles for cooling heat electrical generated devices;
- fusing together thermoplastic polymer films to form a conduit pattern between the films;
- the flexible heat exchanger has a thickness in the range of 5um to 20mm.

Ramshaw fails to disclose the thermoplastic polymer films each comprising an aromatic polyimide substrate film showing no glass transition temperature or a glass transition temperature of 340 degrees C or higher and a thermoplastic aromatic polyimide surface film showing a glass transition temperature in the range of 190 to 300 degrees C fixed to the substrate film in such manner that the surface films face each other; a flexible film having a heat radiant metal layer on one side fixed to the heat

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conductive film; and polyimide films comprising polyimide produced from an aromatic tetracarboxylic acid compound selected from the group consisting of 3,3',4,4'-biphenyltekacarboxylic dianhydride and pyromellitic dianhydride and a diamine compound selected from the group consisting of p-phenylenediamine and a combination of p-phenylenediamine and 4,4'-diaminophenyl ether, and a thermoplastic aromatic polyimide surface film comprising polyimide produced from an aromatic tetracarboxylic acid compound comprising 3,3',4,4'-biphenyltekacarboxylic dianhydride and 4,4'-oxydiphthalic dianhydride and a diamine compound selected from the group consisting of 1,3-bis(4-aminophenoxy)benzene and 1,3-bis(3-aminophenoxy)benzene),

5. However, Takabayashi teaches the use of composite films comprising an aromatic polyimide substrate film showing no glass transition temperature or a glass transition temperature of 340 degrees C or higher and a thermoplastic aromatic polyimide surface film showing a glass transition temperature in the range of 190 to 300 degrees C fixed to the substrate film in such manner that the surface films face each other (column 7; lines 22-40; column 13; lines 67-column 14; line 54); a flexible film having a heat radiant metal layer on one side fixed to the heat conductive film (abstract); and polyimide films comprising polyimide produced from an aromatic tetracarboxylic acid compound selected from the group consisting of 3,3',4,4'-biphenyltekacarboxylic dianhydride and pyromellitic dianhydride and a diamine compound selected from the group consisting of p-phenylenediamine and a

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combination of p-phenylenediamine and 4,4'-diaminophenyl ether, and a thermoplastic aromatic polyimide surface film comprising polyimide produced from an aromatic tetracarboxylic acid compound comprising 3,3',4'-biphenyltetracarboxylic dianhydride and 4p,4p'-oxydiphthalic dianhydride and a diamine compound selected from the group consisting of 1,3-bis(4-aminophenoxy)benzene and 1,3-bis(3-aminophenoxy)benzene (column 5; lines 45-column 6),

Given the teachings of Takabayashi, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the polymer film heat exchanger of Ramshaw with the use of an aromatic polyimide substrate film showing no glass transition temperature or a glass transition temperature of 340 degrees C or higher and a thermoplastic aromatic polyimide surface film showing a glass transition temperature in the range of 190 to 300 degrees C fixed to the substrate film in such manner that the surface films face each other; a flexible film having a heat radiant metal layer on one side fixed to the heat conductive film; and polyimide films comprising polyimide produced from an aromatic tetracarboxylic acid compound selected from the group consisting of 3,3',4'-biphenyltetracarboxylic dianhydride and pyromellitic dianhydride and a diamine compound selected from the group consisting of p-phenylenediamine and a combination of p-phenylenediamine and 4,4'-diaminophenyl ether, and a thermoplastic aromatic polyimide surface film comprising polyimide produced from an aromatic tetracarboxylic acid compound comprising 3,3',4'-biphenyltetracarboxylic dianhydride and 4p,4p'-oxydiphthalic dianhydride and a diamine

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compound selected from the group consisting of 1,3-bis(4-aminophenoxy)benzene and 1,3-bis(3-aminophenoxy)benzene.

Doing so would improve the heat transferring characteristics of the heat exchanger.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramshaw et al. (U.S. 6,059,024) in view of Takabayashi et al. (U.S. 5,262,227) as applied to claims above, and further in view of Yao et al. (U.S. 2003/0129379).

Ramshaw's invention, as modified by Takabayashi, discloses all of the claimed limitations from above except for a heat resistant porous film on a surface having no heat conductive film thereon.

7. However, Yao teaches the use of a heat resistant porous film.

Given the teachings of Yao, it would have been obvious to one of ordinary skill in the art at the time of the invention to furthermore modify the thermoplastic heat exchanger of Ramshaw with a heat resistant porous film on a surface having no heat conductive film thereon.

Doing so would provide a further alternate material for efficiently conducting heat transfer.

8. Claims 13, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramshaw et al. (U.S. 6,059,024) in view of Takabayashi et al. (U.S. 5,262,227) as applied to claims above, and further in view of Philpott et al. (U.S. 2003/0213580).

Ramshaw's invention, as modified by Takabayashi, discloses all of the claimed

limitations from above except for placing one flexible thermoplastic polymer film on another flexible thermoplastic polymer film via a copper foil, intervening flexible thermoplastic polymer, or a thermal head in a reverse pattern of a conduit pattern, fusing both polymer films to combine both polymer films together in part, and etching out the copper foil to form the conduit pattern between the polymer films.

9. However, Philpott teaches a method of making a flexible polymer film heat exchanger comprising one flexible thermoplastic polymer film on another flexible thermoplastic polymer film via a intervening flexible thermoplastic polymer, or a thermal head in a reverse pattern of a conduit pattern, fusing both polymer films to combine both polymer films together in part, and etching out the copper foil to form the conduit pattern between the polymer films.

Given the teachings of Philpott, it would have been obvious to one of ordinary skill in the art at the time of the invention to furthermore modify the thermoplastic heat exchanger of Ramshaw with placing one flexible thermoplastic polymer film on another flexible thermoplastic polymer film via a copper foil, intervening flexible thermoplastic polymer, or a thermal head in a reverse pattern of a conduit pattern, fusing both polymer films to combine both polymer films together in part, and etching out the copper foil to form the conduit pattern between the polymer films.

Doing so would provide a safe and reliable method of manufacturing a thermoplastic heat exchanger.

Response to Arguments

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Applicant's arguments filed November 29, 2004 have been fully considered but they are moot in view of the above mentioned new grounds of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terrell L Mckinnon whose telephone number is 571-272-4797. The examiner can normally be reached on Monday -Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennett can be reached on 571-272-4791. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Terrell L Mckinnon
Primary Examiner
Art Unit 3743
February 22, 2005